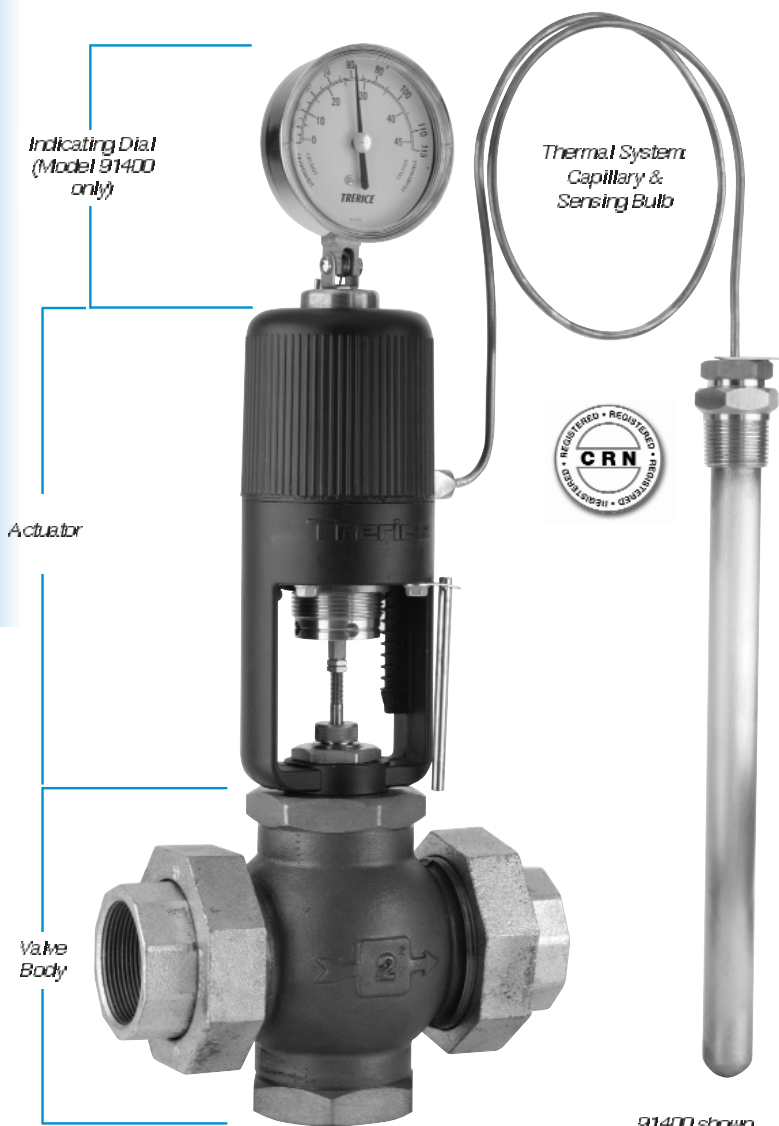


# 91000 Series Temperature Regulator

## The "Self-Op" (Self-Operated Temperature Regulator)

TEMPERATURE REGULATORS



- ▶ Self-Operating Design
- ▶ Indicating, Non Indicating or Safety Models Available
- ▶ Heavy Duty Die Cast Aluminum Housing
- ▶ 1/2" thru 6" Valve Sizes
- ▶ Fully Enclosed Bellows
- ▶ Internal Overrange protection

The **91000 Series** (Models 91000, 91400 & 91600) Self-Operating Temperature Regulator is the preferred choice of original equipment manufacturers, mechanical contractors and specifying engineers. These regulators require no external power source and are ideal for regulating the temperature of tanks, process streams and various types of industrial equipment. The Actuator is noted for its rugged die-cast aluminum housing, fully enclosed bellows assembly and internal over range protection.

Valve bodies for the **91000** are offered in single-seated, double-seated and 3-way designs and are available in Bronze, Cast-Iron, Cast-Steel and Stainless Steel construction.

The Model **91000** (without indicating dial) features a lower profile and should be specified where space constraints may be an issue.

The Model **91400** (with indicating dial) will allow the operator to verify the process temperature and to aid in temperature adjustment.

The Model **91600** Fail-Safe Actuator is designed to cause the valve to fail in the safe control position (open in a cooling application, closed in a heating application) should accidental damage to the thermal system occur, resulting in loss of the pressure charge.

For optimal performance, the service conditions (medium, flow, temperature, inlet and outlet pressures) of the application must be considered when selecting a valve. Please refer to the Valve Selection Section of this catalog. For applications where the process media may be corrosive or contained under pressure, the use of a thermowell is required to prevent damage to the regulator bulb and facilitate its removal from the process. Improper application may cause failure of the valve, resulting in possible personal injury or property damage.

For replacement or service parts please see Accessories and Replacement Parts in the Regulators and Control Valves section of the list price sheet.

### HOW TO ORDER

Sample Order Number: **91400 R06 08 B01 W01 - A26**

Models	Range	Capillary Length†	Thermal System	Thermowell**	Valve Body Selection
91000 Non-Indicating	Refer to	08 8 Feet	Refer to Thermal System Selection Chart (pages 178-179)	W01 - Brass	For 91000/91400 Models (refer to pages 180-187)
91400 Indicating Dial	Standard	12 12 Feet		W02 - Steel	For 91600 Models (refer to page 188) (Omit this selection if purchasing Actuator only)
91600 Fail Safe	Ranges	16 16 Feet		W04 - 316SS	
	(page 176)	20 20 Feet		(Omit if not required)	

\* Thermowell sized to fit bulb as specified. To purchase a thermowell separately, please consult Page 177.

† Other Capillary Lengths available: Specify in 4 Foot increments (52' maximum)

# 91000 Series Temperature Regulator

TEMPERATURE REGULATORS

## Specifications

### Actuator Models

<b>91000</b>	(Non-Indicating)
<b>91400</b>	(Indicating Dial)
<b>91600</b>	(Fail-Safe)

### Power Requirements

Fully self-contained –  
no external power required

### Dial Thermometer

3 1/2" dial, stainless steel case,  
swivel and angle adjustment  
(Model 91400 only)

### Housing

Die cast aluminum, epoxy powder  
coated blue finish

### Set Point Scale

Integral to housing

### Bellows

High pressure brass, corrosion  
resistant, tin plated finish

### Adjustment Screw

Brass

### Adjustment Screw Bushing

Lubricant impregnated  
sintered bronze

### Range Adjustment Spring

Cadmium Plated

### Overrange Protection

Upper range limit +100°F for  
temporary situations  
(not available for Model 91600)

### Approximate Shipping Weight

**Actuator**  
91000: 6.0 lbs [2.70 kg]  
91400: 6.6 lbs [2.97 kg]  
91600: 9.5 lbs [4.32 kg]

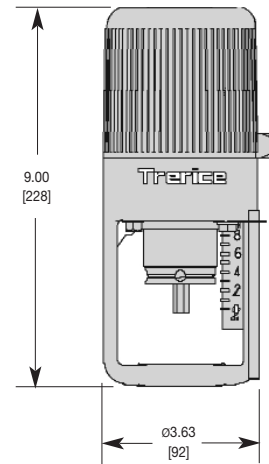
### Valve

See Valve Selection tables

All dimensions are nominal. Dimensions in [ ] are in millimeters.

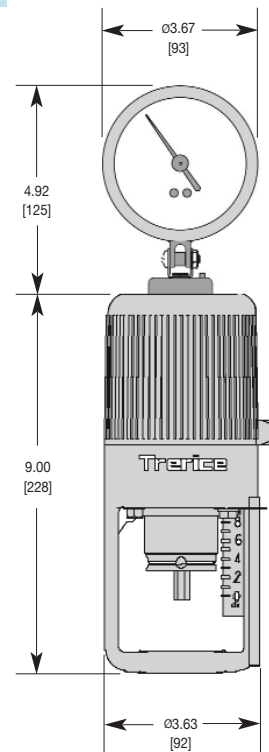
## 91000

### Non-Indicating Actuator



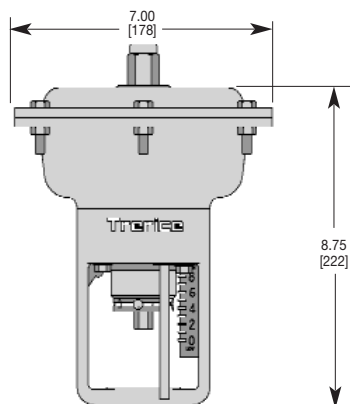
## 91400

### Indicating Actuator



## 91600

### Fail-Safe Actuator



# Temperature Ranges

## The “Self-Op” Temperature Regulator (91000, 91400, & 91600 Models)

TEMPERATURE REGULATORS

### Standard Ranges

91000 & 91400 Actuators				
Range Code	Nominal Range	Recommended Working Span		Dial Thermometer Range (Model 91400 only)
		Single Seat, In-To-Close Valves Double Seat, In-To-Close Valves Double Seat, In-To-Open Valves All 3-Way Valves	Single Seat In-To-Open Valves	
R01*	20° to 70°F & -10° to 20°C	40° to 65°F & 5° to 20°C	N/A	30° to 115°F & C
R02*	40° to 90°F & 5° to 30°C	65° to 85°F & 20° to 30°C	N/A	50° to 140°F & C
R03	30° to 115°F & 0° to 45°C	85° to 110°F & 30° to 45°C	50° to 80°F & 10° to 25°C	30° to 115°F & C
R04	50° to 140°F & 10° to 60°C	110° to 135°F & 45° to 60°C	80° to 105°F & 25° to 45°C	50° to 140°F & C
R05	75° to 165°F & 25° to 70°C	135° to 160°F & 60° to 70°C	105° to 130°F & 40° to 50°C	75° to 165°F & C
R06	105° to 195°F & 40° to 90°C	160° to 190°F & 70° to 90°C	130° to 155°F & 50° to 65°C	105° to 195°F & C
R07	125° to 215°F & 55° to 100°C	190° to 210°F & 90° to 100°C	155° to 180°F & 65° to 80°C	125° to 215°F & C
R09	155° to 250°F & 70° to 120°C	210° to 245°F & 100° to 120°C	180° to 215°F & 80° to 100°C	155° to 250°F & C
R10	200° to 280°F & 95° to 135°C	245° to 275°F & 120° to 135°C	215° to 245°F & 100° to 120°C	200° to 280°F & C
R11	225° to 315°F & 110° to 155°C	275° to 310°F & 135° to 155°C	245° to 280°F & 120° to 140°C	225° to 315°F & C
R12	255° to 370°F & 125° to 185°C	305° to 365°F & 155° to 185°C	275° to 335°F & 135° to 165°C	255° to 370°F & C
R13	295° to 420°F & 145° to 215°C	365° to 415°F & 185° to 215°C	335° to 385°F & 165° to 195°C	295° to 420°F & C
R14	310° to 440°F & 155° to 225°C	415° to 435°F & 215° to 225°C	385° to 405°F & 195° to 205°C	310° to 440°F & C

\*Not recommended for single seated valves.

The recommended working span typically falls within the upper third of the nominal range. Single Seat In-To-Close, all Double Seat, and all 3-Way valves have a recommended working span in this part of the nominal range. However, due to differing thrust requirements, Single Seat In-To-Open valves have a recommended working span in the middle one-third of the nominal range.

### Standard Ranges

91600 Fail-Safe Actuators	
Range Code	Nominal Range and Recommended Working Span
R81	40° to 65°F & 5° to 20°C
R82	55° to 80°F & 15° to 25°C
R83	65° to 90°F & 20° to 30°C
R84	80° to 110°F & 25° to 40°C
R85	90° to 115°F & 30° to 45°C
R86	110° to 140°F & 40° to 60°C
R89	140° to 175°F & 60° to 80°C
R90	170° to 195°F & 80° to 90°C
R91	190° to 210°F & 85° to 100°C
R92	205° to 225°F & 95° to 105°C
R93	215° to 250°F & 100° to 120°C
R94	230° to 265°F & 110° to 130°C
R95	245° to 280°F & 120° to 135°C
R96	270° to 300°F & 135° to 150°C